

**Rancho La Costa
Habitat Conservation Area**

(S016, S020, S022, and S026)

A Dedicated Natural Open Space System Set Aside as Part
of the La Costa Villages and University Commons Developments
which also includes the “Nelson” parcel.

Annual Report

October 2005 - September 2006

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California Department of Fish and Game
City of Carlsbad
City of San Marcos

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I. INTRODUCTION

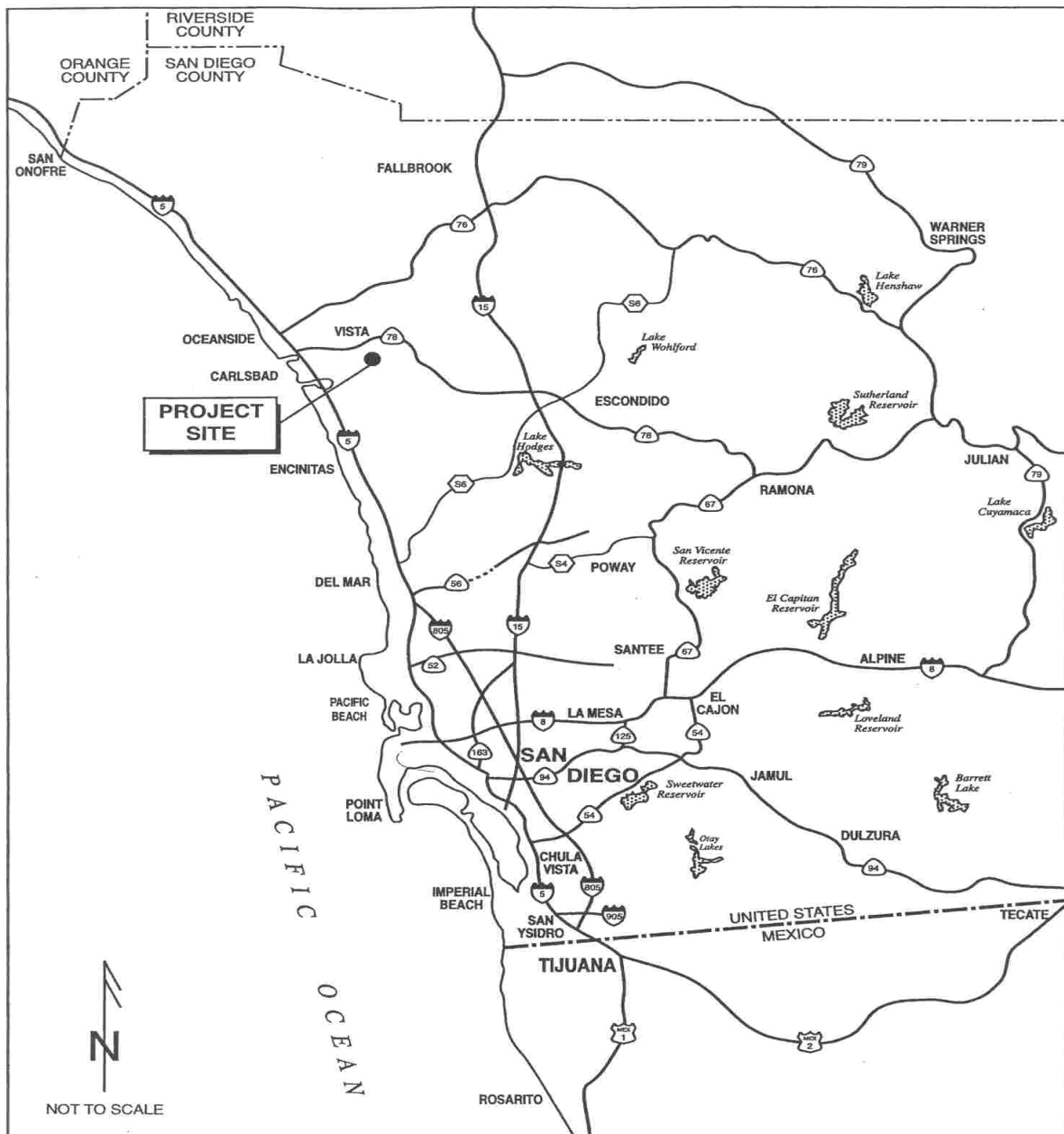
This report summarizes the management activities carried out at the Rancho La Costa Habitat Conservation Area (HCA) by the Center for Natural Lands Management from October 1, 2005 to September 30, 2006.

The HCA was created by combining several areas which were dedicated to the Center for Natural Lands Management (CNLM) for long term management from the La Costa Villages and University Commons developments. Each development dedicated several parcels which have been identified in the past by various names or associations. The La Costa Villages project dedicated parcels referred to as: Oaks, Ridges, Greens, Choumas-Pappas, and Alemir, of which the former three are located in Carlsbad, and the latter two are located in the County of San Diego. The University Commons project dedicated parcels referred to as the “on-site parcels”, Frank’s Peak, Pfau (Conservation Easement), Huff, Wilern, Winston and Setter and Elfin Forest (Conservation Easement). The Elfin Forest parcels are located both on-site (San Marcos) and within the County of San Diego. The Setter parcel is within the County of San Diego. All the other University Commons parcels are located within the City of San Marcos. The Nelson parcel was purchased by the National Fish and Wildlife Foundation and deeded to CNLM. This parcel is located in the County of San Diego.

The HCA is located approximately two miles inland from the Pacific Ocean and lies between El Camino Real, near Palomar Airport Road and Elfin Forest. (Figures 1 and 2). The HCA consists of several parcels separated by roads, homes, golf courses and other developments. Parcel sizes range from a few acres to over 500 acres. Vegetation communities include Diegan coastal sage scrub, chaparral, sycamore/oak woodland, willow woodland, native and nonnative grassland, and disturbed areas.

The tasks and objectives discussed below are those derived from the *Rancho La Costa Habitat Conservation Area Annual Work Plan 2005-2006* (CNLM 2005a) and the *Habitat Management Plan for Rancho La Costa Habitat Conservation Area* (CNLM 2005b), prepared by CNLM and submitted to the County of San Diego, City of Carlsbad, City of San Marcos, United States. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG).

Management of the HCA includes posting and maintaining signs and maintaining fences and gates (capital improvements), biological surveys, habitat restoration, public services and reporting. Each of these activities and their fiscal year results are summarized below and fully described within this report.



Regional Location Map

Figure 1

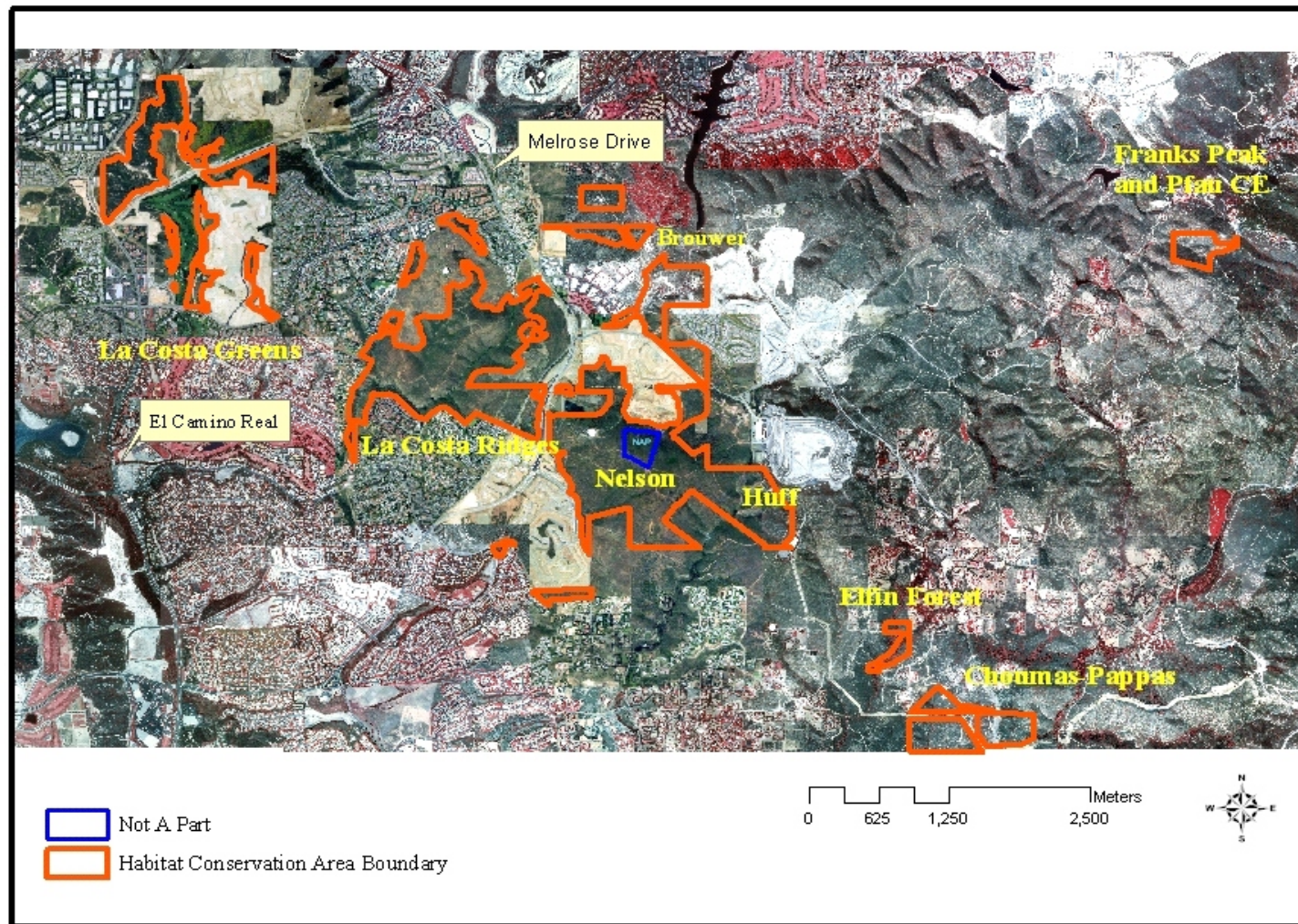


Figure 2. Preserve Location

SUMMARY OF 2005-2006 FISCAL YEAR ACTIVITIES

- Bird community surveys were conducted using point counts
- Wildlife corridor tracking was completed at several locations within the HCA
- The condition of the thread-leaved brodiaea (*Brodiaea filifolia*) habitat at La Costa Greens was assessed
- Focused surveys for thread-leaved brodiaea and San Diego thornmint (*Acanthomintha ilicifolia*) were conducted.
- Pilot studies for ant species composition and distribution were initiated.
- A 5 to 6-mile trail system was developed using existing trails. Seven kiosks and about 300 linear feet of post and rail fencing were installed. Trail signs were posted throughout the trail system.
- Non-native plant species were controlled or removed
- Herbicide experiments were conducted on onion weed (*Asphodelus fistulosus*) and a herbicide experiment was established to test the effects of specific herbicide treatments on thread-leaved brodiaea
- CNLM spent considerable time and resources enforcing unwanted trespass

II. CAPITAL IMPROVEMENTS

The primary fencing and gating that was installed this year was related to the trail system that was created near Box Canyon and east of Junipero Street (see Public Services section). Over the last several years, CNLM has controlled unwanted access (off-road vehicles) by installing several gates and fences along the periphery and major access points of the HCA. Although motorcycles do get into the HCA from time to time, they are generally accessing the site from private property to the north and south from which we have no ability to control. The number of motorcycles coming into the HCA is minimal at this time. We installed about 500 linear feet of barbed wire along boundaries of the mid-section (east of Junipero) of the HCA to close off unwanted trails and develop “no access” areas. No other capital improvements were done during the year.

III. BIOLOGICAL SURVEYS

This fiscal year was the 5th year of biological surveys carried out by CNLM at the HCA. Previous surveys had been conducted by numerous biological consulting firms and are reported in the biological impact assessment reports and EIR’s for the La Costa Villages and University Commons Open Space Areas.

The *Habitat Management Plan* (HMP, CNLM 2005b) outlines the goals of biological monitoring at the HCA. The general goals of the monitoring activities at the HCA at this time are to 1) conduct focused surveys for the coastal California gnatcatcher (CAGN), 2) evaluate the changes

in structure and composition of the coastal sage scrub vegetation community, 3) identify and measure the potential threat that nonnative grass species may have to thread-leaved brodiaea and native grasslands, 4) study the use of wildlife corridors by mammal species and 5) assess/monitor the changes in the native ant community as part of San Diego horned lizard (*Phrynosoma coronatum blainvillii*) research.

Monitoring activities this fiscal year included bird community surveys, ant community surveys, wildlife corridor surveys, focused annual plant surveys, and thread-leaved brodiaea surveys.

Table 1 outlines survey dates, times, weather conditions and type of survey conducted. Unless noted otherwise, all surveys and monitoring activities that require wildlife agency permits were conducted by Markus Spiegelberg who is permitted by the USFWS and CDFG (USFWS PRT-787-924, Scientific Collectors Permit # 801106-05) for the gnatcatcher and other listed species. Jessie Vinje conducted all plant and vegetation activities.

1. Reptiles

As part of our San Diego horned lizard (SDHL) research and monitoring program we set up a pilot ant study program to begin to document changes in the ant community. It is well known that the primary prey base of the SDHL are harvester ants (*Messor andrei* for the RLC HCA), and we are interested to learn more about the potential effect of increased urbanization and increased edge to area ratio on the changes in the ant community, and the potential loss of harvester ants to Argentine ants (*Linepithema humile*). We set out ant pit cups (10 ounce beer cup filled with antifreeze and water) along randomly selected vegetation transects that were set up in 2005 as part of our vegetation monitoring program. By using these locations, we hope to study ant composition at various distances to the edge and in different vegetation structure and composition. At each transect, we placed one cup at the 1 meter and 49th meter of the 50 meter transect and left the cup out for seven days before collecting and storing the contents.

Results of our ant studies will be presented in the 2006-2007 annual report as we intend on to conduct fall or winter ant transects in 2006-2007 and will present our data in a combined effort.

2. Birds

As stated in our HMP, CNLM has two primary goals regarding bird species found at the HCA. One is to determine the population status of the coastal California gnatcatchers (CAGN) and other sensitive birds using “focused” total area surveys. The other is to try to develop a program that provides meaningful “trends” in the entire bird community (or selected species) using point counts. We alternate years for these activities.

Table 1. Survey dates, times and weather conditions.

Survey Date	Time	Weather Conditions	Type of Survey*	Location
November 23-December 23, 2005	one month		WC	Hidden Canyon
November 11-December 15, 2005	one month		WC	Hidden Canyon
November 26, 2005	07:35-12:00		WT	Rancho Santa Fe Road (RSF) Undercrossing
December 26, 2006	08:30-13:00		WT	RSF Undercrossing
February 18, 2006	08:00-12:00		WT	RSF Undercrossing
March 26, 2006	08:00-12:00		WT	RSF Undercrossing
May 6, 2006	08:00-12:00		WT	RSF Undercrossing
May 20, 2006	08:15-11:00		WT	RSF Undercrossing
March 13-April 11, 2006	one month		WC	Hidden Canyon
April 17, 2006	7:03-12:00	Partly cloudy, 0-6 mph wind, 55-62 °F	APC	RLC Middle
April 13, 2006	06:54-10:45	Clear, 0-2 mph wind, 54-72 °F	APC	Box Canyon
April 25, 2006	06:19 - 9:45	Clear, 1-3 mph wind, 48-57 °F	APC	RLC East to quarry
April 28-May 30, 2006	one month		WC	Hidden Canyon
May 30 -June 2, 2006	one month		WC	RSF Undercrossing
May 5, 2006	07:19 - 11:25	Cloudy, 58-65 °F	APC	Choumass-pappas
May 8, 2006	06:57 - 11:30	Overcast, 1-2.5 mph wind, 56-67 °F	APC	RLC Middle
May 10, 2006	07:02 - 10:15	Overcast, 0-1.5 mph wind, 60-65 °F	APC	RLC East to quarry
May 19, 2006	07:08 - 10:30	Overcast, 0-1.5 mph wind, 61-70 °F	APC	Choumass-pappas
June 5-12, 2006	One week	Overcast in a.m., clear during the day for most of the week, wind less than 10 mph, 65-80 °F	Ant arrays	Box Canyon, Brouwer quarry and RLC middle
April 18 and 24, 2006	All Day		BRFI Grassland Plots	
May 4, 2006	One hour		ACIL Surveys	
June 6, 12, and 13, 2006	Several hours each day		BRFI Surveys and Mapping Grassland Plots	
August 19, 2006	08:00-11:00		WT	RSF Undercrossing
September 9, 2006	08:00-11:00		WT	RSF Undercrossing

* APC = Avian Point Count. WC= Wildlife Camera. WT=Wildlife Tracking. BRFI = Thread-leaved Brodiaea. ACIL= San Diego Thornmint.

In the spring of 2006, we continued with our bird community monitoring that was initiated in 2003 and 2004. We used our 2003 and 2004 data to revise the monitoring methodology based on the results of our statistical analysis. Our previous analysis has indicated that our bird community monitoring will likely have to focus on a suite of perhaps five to six species as we don't have enough acreage to accommodate more point locations that we need (see the 2003-2004 annual report and the HMP for details) for all species. Our analysis suggested adding more points where possible. In 2006, we used 24 point locations from previous years work and added 34 additional points for a total of 58 points. All points are within coastal sages scrub (i.e. primary habitat of the HCA).

We modified our sampling methodology as well. We recorded all birds observed or detected in three 3-minute intervals and used a taped vocalization of the CAGN for 30 seconds prior to each interval. The goal of using the taped vocalization was to determine if we could increase our detection probability of this species and therefore, reduce the number of visits required. The USFWS has tested a protocol similar to ours but did not use a taped vocalization. Their analysis of detection probabilities determined that their survey protocol would require five visits to each point and six 3-minute intervals per visit to have a 75-80% likelihood of detection. We felt that we could decrease the number of visits and time spent on each point per day by playing a taped vocalization and possibly have a similar result. We visited each point twice during the breeding season (see Table 1). We monitored birds during April and May of 2006.

Data from our bird surveys will be presented in future reports. Preliminary review of our 2006 data suggests that we still do not have enough points to be able to determine meaningful changes in most species. Therefore, we are putting this monitoring program aside for the time being until we acquire more land or decide to revisit the issue.

Other notable species include three red-tailed hawk (*Buteo jamaicensis*) nests, a number of Bell's sage sparrow (*Amphispiza belli belli*), least Bell's vireo (*Vireo bellii pusillus*) and grasshopper sparrows (*Ammodramus savannarum perpallidus*).

3. Mammals

Mammal monitoring activities focused on developing a wildlife movement program to understand and study trends in wildlife movement at "pinch point" locations and movement corridor locations within the HCA.

The MHCP Management and Monitoring Plan (MMP) outlines several locations of interest for wildlife movement studies in north San Diego county, of which only one is near or within a CNLM preserve:

[CNLM Reference # SMC 1] San Marcos Creek (SMC) at Rancho Santa Fe Road

Wildlife Undercrossing Bridge (connects La Costa Villages HCA area in Carlsbad with University Commons HCA area in San Marcos)

CNLM has located several other areas of interest for wildlife movement tracking at its Rancho La Costa HCA (Figure 3):

[CNLM Reference # SMC 2] San Marcos Creek at Melrose Road Wildlife Undercrossing Bridge (connects La Costa Villages HCA area in Carlsbad with University Commons HCA area in San Marcos and is about ½ mile upstream of the Rancho Santa Fe Wildlife Under-crossing Bridge)

[CNLM Reference # SMC 3] San Marcos Creek near the west end of Box Canyon and Gibraltar Street. This connects Box Canyon to the La Costa Golf Course (which connects indirectly/directly to Batiquitos Lagoon). This is mostly willow and sycamore woodland

[CNLM Reference # RSF 1] Rancho Santa Fe (RSF) Road Wildlife Under-crossing Tunnel (connects HCA areas on the eastern and western sides of Rancho Santa Fe Road about ½ mile south of the intersection of San Elijo Road and Rancho Santa Fe Road

[CNLM Reference # EF 1] Elfin Forest (EF) tributary creek to Escondido Creek (on CNLM property). A small, narrow riparian strip of oak/sycamore woodland that serves as a movement corridor in Elfin Forest (about ¼ mile west of the intersection of Suerte del Este and Fortuna Del Este in Elfin Forest

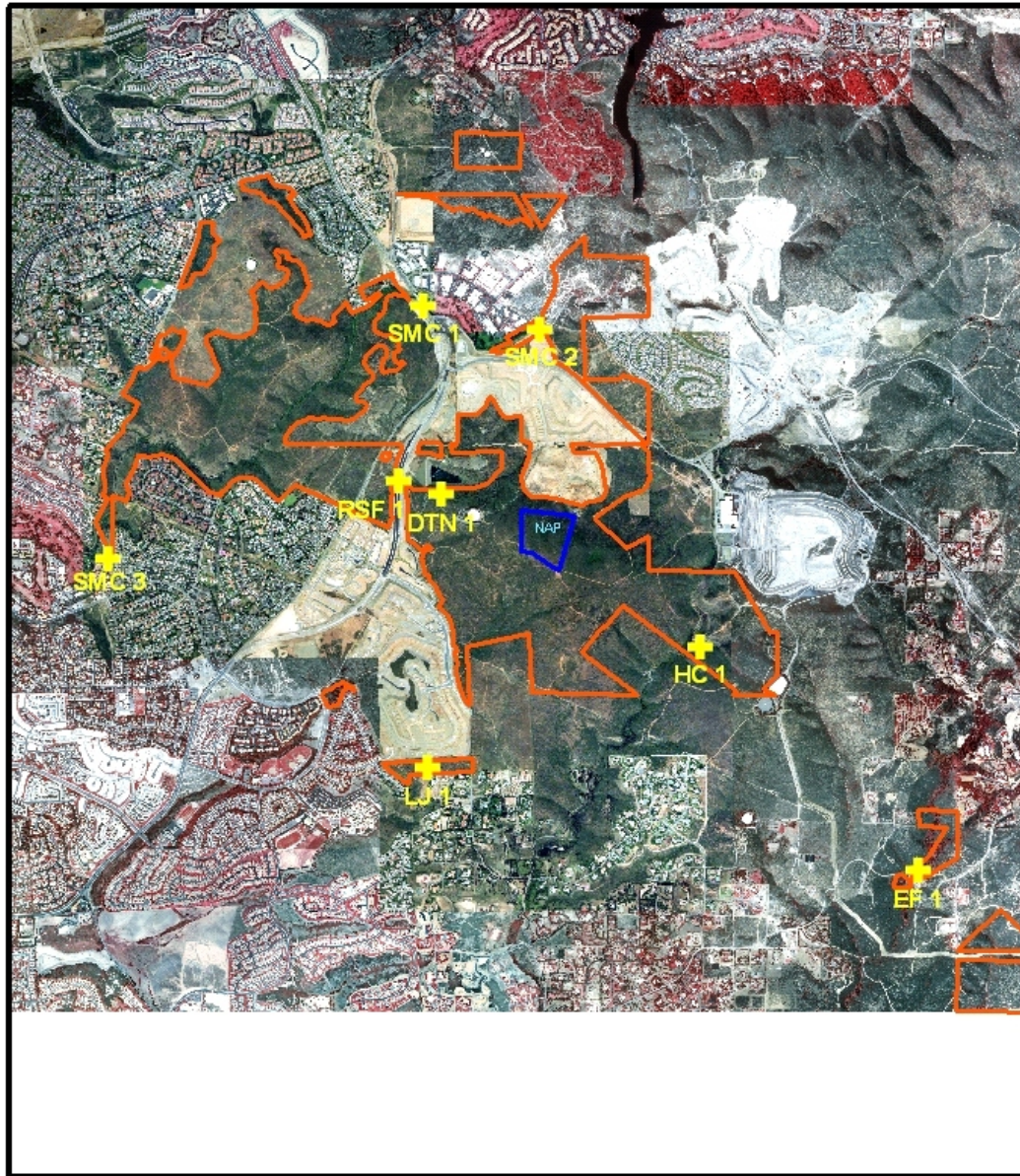
[CNLM Reference # HC 1] Hidden Canyon (HC) Wildlife Corridor. This area is located in the southeastern most portion of San Marcos, and connects CNLM land in Carlsbad and San Marcos (La Costal Villages and University Commons) to Elfin Forest, Harmony Grove and Escondido. Habitat in this location includes willow woodland restoration areas, Diegan coastal sage scrub and chaparral

[CNLM Reference # LJ 1] Lone-jack (LJ) Road Wildlife Pinch Point. Located at the southern side of the La Costa Oaks Development. This is a upland (CSS) wildlife movement connection point that connects the “Shelly” property to the east to the riparian (unknown name of creek) area to the west

[CNLM Reference # DKN 1] Denk Tank (DKN) North Corridor along Vallecitos Water District (VWD) water reservoir. Located from the RSF under-crossing to about 250 meters east along the VWD fence line. This is a “leader” path to and from the RSF under-crossing

CNLM’s HMP focuses primarily on mammalian predators, such as grey fox (*Urocyon cinereoargenteus*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*) and coyote (*Canis latrans*). However, we are also documenting other use of these movement areas to include mule deer (*Odocoileus hemionus*) and racoon (*Procyon lotor*). The following questions were asked in conjunction with these locations:

1. What mammalian predators are using the corridor areas described above?
2. What is the frequency and temporal variation of mammalian predator use of these



Wildlife Tracking Locations

Figure 3

corridors?

3. How does the mammalian predator use of these areas change over time?
4. What are the characteristics of each wildlife movement area and how might that affect movement?

This year we focused on DKN 1, RSF 1, HC 1 and EF 1 to test newly purchased wildlife cameras and to test a pilot design for tracking wildlife under the RSF 1 under-crossing. We were unable to work at SMC 1 and 2 due to bridge construction activities. We decided to wait to study LJ 1 and SMC 3 once we had established a tested monitoring approach.

At RSF 1, CNLM worked with the San Diego Tracking Team (SDTT) to note mammal activity at each end and within the wildlife under-crossing. We set out several transects leading up to and through to under-crossing (see Figure 3). We monitored these transects during each season of the year (see Table 1). Monitoring consisted of walking the transect once per season and noting any track, scat or sign of mammalian predators and the mule deer and racoon.

We posted wildlife cameras (Cuddeback Digital Scouts) at the HC 1, DKN and EF 1 sites. We posted the cameras for two month periods at the HC 1 site, and one month period at the DKN and EF 1 sites (see Table 1). The Cuddeback digital remote cameras record date and time of the movement taken by a picture allowing us to quantify movement in any given month.

Results. Our tracking results at RSF 1 found that coyote, fox, bobcat, mule deer and racoon approached the wildlife under-crossing at both sides, but did not go through the crossing. We observed track and sign of animal crossing the road instead. We found sign of fox, mule and coyote in all seasons, and sign of bobcat in the fall and summer sessions. Coyote and mule deer sign were most abundant.

A summary of wildlife activity recorded at HC 1, DKN 1 and EF 1 using remote cameras is summarized in Table 3. Our data suggests that these three locations do function as wildlife movement locations as expected and will be important for future study. We noted several “hits” of mule deer at the HC1 and DKN 1 locations. Mule deer were observed grazing in front of the DKN 1 location, just 50 yards away from the RSF wildlife undercrossing.

Mule deer scat was observed west of Box Canyon, the first time this has been recorded since the CNLM began management of the area. This shows that mule deer are either crossing at the RSF undercrossing or under the RSF bridge and moving westward into the HCA.

Table 2. Results of wildlife camera studies (number of animal observed during session)

Camera Location:	HC 1		DKN 1	EF 1
Species:	Winter	Spring*	Spring/Summer	Winter
Coyote	5	0	0	6
Bobcat	1	0	0	11
Mule deer	5	0	6	1
Raccoon	1	0	0	1

*It is likely that the lack of observations is due to vegetation growth (restoration project in canyon) in front of the camera rather than a lack of movement. Animals were likely shielded by the vegetation.

4. Vegetation Sampling

In 2004, CNLM began pilot studies on the Greens parcel where there are several thousand thread-leaved brodiaea. Our goal has been to quantify the cover of nonnative and native plant species, and conduct de-thatching experiments, so that we can determine if de-thatching can help reduce nonnative cover. In 2004 we created a 15 meter X 15 meter stratified random plot with five randomly placed transects along one of the sides of the plot. In 2005, we added four additional plots. Along each transect, we placed randomized 0.25 x 0.5 meter quadrats spaced one meter apart. In each quadrat, species and percent cover (point intercept) data were collected along each transect. In June of 2005, we removed all the thatch from Plots 1 and 2 (see Habitat Restoration Section of this report). The results from the 2006 vegetation sampling effort are presented in Tables 3 and 4 below.

The average percent cover of each plant species was calculated by taking the average number of “hits” per transect in the plot. Live plants were included in the percent cover calculations and dead plant material was included as litter and was primarily comprised of purple false-brome (*Brachypodium distachyon*) thatch.

The average percent cover for native bulbs and forbs was higher in the de-thatch plots than the non-de-thatch plots, perhaps indicating that the bulbs and forbs recruit better without the dense thatch cover. The exception was thread-leaved brodiaea: the percent cover for this bulb was higher in the non-de-thatch plots (likely due to the fact that more thread-leaved brodiaea plants historically occurred in the non-de-thatch plots than in the de-thatch plots). The average percent cover for native perennials and grasses was higher in the non-de-thatch plots than the de-thatch plots (likely due to the fact that more mature native perennial shrubs and grasses naturally occur in the non-de-thatch plots). The average percent cover for nonnative grasses and forbs was mixed between the plots. The average percent cover for litter (thatch primarily comprised of purple false-brome) was much lower in the de-thatch plots compared to the control, as expected.

Table 3. Grassland Study Plots (Average Percent Cover by Species)

Growth Habit	Species	Average Percent Cover (Standard Deviation)				
		Plot 1 Dethatch Plot	Plot 2 Dethatch Plot	Plot 3 Non-dethatch Plot	Plot 4 Non-dethatch Plot	Plot 5 Non-dethatch Plot
bulb	Thread-leaved brodiaea (<i>Brodiaea filifolia</i>)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.7 (1.5)
bulb	bulb (unknown species)	0.7 (1.5)	0.7 (1.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Clay bindweed (<i>Convolvulus simulans</i>)	0.7 (1.5)	0.7 (1.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Fascicled tarweed (<i>Deinandra fasciculata</i>)	0.7 (1.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
ng	Purple needle-grass (<i>Nassella pulchra</i>)	0.0 (0.0)	0.0 (0.0)	1.4 (1.9)	0.0 (0.0)	0.0 (0.0)
nnf	Black mustard (<i>Brassica nigra</i>)	0.7 (1.5)	1.4 (1.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnf	Tocalote (<i>Centaurea melitensis</i>)	12.4 (7.6)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnf	Bristly ox-tongue (<i>Picris echioides</i>)	0.0 (0.0)	0.0 (0.0)	0.7 (1.5)	0.0 (0.0)	2.1 (4.6)
nnf	Prickly sow-thistle (<i>Sonchus asper</i>)	0.0 (0.0)	0.7 (1.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nng	Wild oat (<i>Avena fatua</i>)	0.7 (1.5)	1.4 (1.9)	1.4 (3.1)	0.0 (0.0)	5.5 (3.9)
nng	Purple false-brome (<i>Brachypodium distachyon</i>)	22.8 (10.5)	33.1 (18.8)	36.6 (5.2)	36.6 (18.3)	34.5 (5.5)
nng	Soft-chess brome (<i>Bromus hordeaceus</i>)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.7 (1.5)
nng	Red brome (<i>Bromus madritensis</i> ssp. <i>rubens</i>)	1.4 (3.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnp	Fennel (<i>Foeniculum vulgare</i>)	1.4 (1.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.4 (3.1)
np	Morning glory (<i>Calystegia macrostegia</i>)	0.7 (1.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
np	Saw tooth goldenbush (<i>Hazardia squarrosa</i>)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.1 (3.1)	0.0 (0.0)
np	Blue-eyed grass (<i>Sisyrinchium bellum</i>)	0.0 (0.0)	0.0 (0.0)	2.1 (3.1)	2.8 (1.5)	0.0 (0.0)
bg	Bare Ground	38.6 (13.4)	40.0 (20.9)	0.0 (0.0)	0.0 (0.0)	3.4 (4.9)
litter	Litter	22.8 (13.1)	24.1 (8.4)	76.6 (22.0)	60.7 (17.0)	75.9 (25.9)

bulb=native bulb; nf=native forb; ng=native grass; nnf=nonnative forb; nng=nonnative grass; nnp=nonnative perennial; np=native perennial; bg=bare ground; and litter=primarily nonnative grass litter ** APC=average percent cover; sd=standard deviation

Table 4. Grassland Study Plots (Average Percent Frequency by Species)

Growth Habit	Species	Average Percent Frequency (Standard Deviation)				
		Plot 1 Dethatch Plot	Plot 2 Dethatch Plot	Plot 3 Non-Dethatch Plot	Plot 4 Non-Dethatch Plot	Plot 5 Non-Dethatch Plot
bulb	Soap plant (<i>Chlorogalum parviflorum</i>)	14.7 (17.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Mock parsley (<i>Apiastrum angustifolium</i>)	28.0 (30.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Clay bindweed (<i>Convolvulus simulans</i>)	20.0 (8.2)	17.3 (7.6)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Horseweed	0.0 (0.0)	5.3 (5.6)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Conyza species	1.3 (3.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Cryptantha	1.3 (3.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Cryptantha species	16.0 (13.0)	1.3 (3.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Fascicled tarweed (<i>Deinandra fasciculata</i>)	16.0 (13.0)	1.3 (3.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Arroyo lupine (<i>Lupinus succulentus</i>)	0.0 (0.0)	2.7 (6.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Small-flower microseris (<i>Microseris douglasii</i> ssp. <i>platycarpha</i>)	16.0 (16.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nf	Silver puffs (<i>Uropappus lindleyi</i>)	1.3 (3.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
ng	Purple needle-grass (<i>Nassella pulchra</i>)	22.7 (22.9)	1.3 (3.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnf	Scarlet pimpernel (<i>Anagallis arvensis</i>)	40.0 (24.0)	5.3 (8.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnf	Black mustard (<i>Brassica nigra</i>)	48.0 (36.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	5.3 (5.6)
nnf	Tocalote (<i>Centaurea melitensis</i>)	18.7 (41.7)	16.0 (16.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnf	Red-stem filaree (<i>Erodium cicutarium</i>)	20.0 (26.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnf	Petty spurge (<i>Euphorbia peplus</i>)	1.3 (3.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnf	Smooth cats-ear (<i>Hypochaeris glabra</i>)	2.7 (3.7)	1.3 (3.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnf	Bristly ox-tongue (<i>Picris echinoides</i>)	0.0 (0.0)	14.7 (11.0)	10.7 (13.8)	10.7 (13.8)	18.7 (21.8)
nnf	Dwarf plantain (<i>Plantago virginica</i>)	5.3 (8.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnf	Prickly sow-thistle (<i>Sonchus asper</i>)	10.7 (8.9)	26.7 (8.2)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnf	Common sow-thistle (<i>Sonchus oleraceus</i>)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	6.7 (4.7)
nng	Wild oat (<i>Avena fatua</i>)	4.0 (6.0)	5.3 (8.7)	14.7 (9.9)	14.7 (9.9)	61.3 (31.1)
nng	Wild oat	2.7 (3.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nng	Avena species	18.7 (41.7)	0.0 (0.0)	72.0 (41.5)	72.0 (41.5)	76.0 (39.0)
nng	Purple false-brome	18.7 (41.7)	0.0 (0.0)	72.0 (41.5)	72.0 (41.5)	76.0 (39.0)

nng	(<i>Brachypodium distachyon</i>) Ripgut brome	21.3 (14.5)	1.3 (3.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nng	(<i>Bromus diandrus</i>) Soft-chess brome	30.7 (19.8)	53.3 (14.9)	1.3 (3.0)	1.3 (3.0)	5.3 (5.6)
nng	(<i>Bromus hordeaceus</i>) Red brome	0.0 (0.0)	0.0 (0.0)	1.3 (3.0)	1.3 (3.0)	4.0 (6.0)
nng	(<i>Bromus madritensis</i> ssp. <i>rubens</i>) Italian ryegrass	6.7 (11.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.3 (3.0)
nng	(<i>Lolium multiflorum</i>) Rattail fescue	22.7 (24.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
nnp	(<i>Vulpia myuros</i> var. <i>myuros</i>) Australian saltbush	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.3 (3.0)
nnp	(<i>Atriplex semibaccata</i>) Fennel	6.7 (11.5)	1.3 (3.0)	0.0 (0.0)	0.0 (0.0)	1.3 (3.0)
np	(<i>Foeniculum vulgare</i>) Morning glory	8.0 (8.7)	5.3 (3.0)	1.3 (3.0)	1.3 (3.0)	0.0 (0.0)
np	(<i>Calystegia macrostegia</i>) San Diego gumplant	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	8.0 (8.7)
np	(<i>Grindelia camporum</i> var. <i>bracteosum</i>) Saw-tooth goldenbush	2.7 (3.7)	0.0 (0.0)	1.3 (3.0)	1.3 (3.0)	0.0 (0.0)
np	(<i>Hazardia squarrosa</i>) Blue-eyed grass	16.0 (15.3)	0.0 (0.0)	26.7 (9.4)	26.7 (9.4)	0.0 (0.0)
	(<i>Sisyrinchium bellum</i>)					

*bulb=native bulb; hf=native forb; hg=native grass; nhf=nonnative forb; nng=nonnative grass; nnp=nonnative perennial; np=native perennial; bg=bare ground; and litter=primarily nonnative grass litter

At this time, we are unable to determine if de-thatching is favoring native plant species as we only have one year of data. However, it does appear that native bulbs and forbs will increase in cover in the de-thatch plots. The average percent cover of the dominant nonnative grass (purple false brome) has not decreased significantly from 2005. CNLM will continue this experiment for five additional years and determine whether detaching is beneficial to the native plants, including thread-leaved brodiaea.

The average percent frequency (See Table 4) is calculated as the percentage of possible quadrats within a plot (per transect) that are occupied by a given species. Dead plant material, primarily comprised of purple false-brome thatch, was encountered in every quadrat and was therefore not calculated as the frequency of purple false-brome litter was 100 percent in the non-de-thatch plots.

Species diversity within each plot was measured more effectively by collecting frequency data using quadrats rather than using the point intercept data. Overall, the diversity of native bulbs, native forbs and native grasses was higher in the de-thatch plots versus the non-de-thatch plots. This is perhaps an indication that these species recruit better without high levels of thatch. For the most part, the native perennials followed the same trend and tended to be more numerous in the de-thatch plots than the non-de-thatch plots (blue-eyed grass was the exception). Nonnative

forbs also tended to be more frequent in the de-thatch plots than the non-de-thatch plots. The results for nonnative grass frequency was mixed. Purple false-brome was more frequent in the non-de-thatch plots and the other nonnative grasses were more frequent in the de-thatch plots.

Overall, most species tended to be more frequent in the de-thatch plots than the non-de-thatch plots. It is too early to determine if there is correlation between frequency of plant species and de-thatching and non-de-thatching, but it does appear that de-thatching does favor the recruitment of native bulbs, forbs and grasses, as well as nonnative forbs and some grasses. This is likely due to the bare soil that is exposed during de-thatching (allowing for seed to germinate easily because of access to sunlight, water and potentially to nutrients). CNLM will continue this experiment for five additional years and determine whether detaching is beneficial to the native plants, including thread-leaved brodiaea.

6. Plant Species and Sensitive Plants

In 2006, the only focused sensitive plant surveys were for thread-leaved brodiaea and San Diego thornmint. Approximately 83 thread-leaved brodiaea plants and approximately 150 San Diego thornmint plants were located at the Greens property (Figure 4). During the 2004-2005 thread-leaved brodiaea surveys, approximately 2,500-3,000 individuals were located and approximately 1,000 San Diego thornmint plants were located. The drop in population numbers can likely be attributed to low rainfall and the naturally high variation in annual reproduction and recruitment for these species. The total precipitation in 2005 was approximately 37.65 inches versus approximately 6.68 inches for northern San Diego County in 2006 (Desert Research Institute 2006). No other focused sensitive plant species were conducted.

Additionally, more thread-leaved brodiaea plants were observed growing in the non-dethatch plots as opposed to the dethatch plots. CNLM had originally thought that dethatching may favor the growth of thread-leaved brodiaea. Several more years of surveys and dethatching experiments will determine whether or not dethatching actually favors growth of thread-leaved brodiaea.

CNLM has revised its biological monitoring schedule of activities as presented in the HMP based on recent data collected (Table 5). The primary change is that we have discontinued our bird community surveys (see bird results section in this report) which removes surveys scheduled for 2008 and 2010, and have added wildlife corridor work in 2006. We also discontinued our herp array work as we feel we have collected the information we need to apply a more adaptive management approach.

IV. HABITAT RESTORATION

Habitat restoration goals for the HCA at this time include removing non-native plants and may include other tasks in the future . There are several populations of pampas grass, eucalyptus,



**Rancho La Costa HCA "The Greens"
Sensitive Plant Locations 2006**

Table 5. Updates and Changes to the Schedule of Biological Monitoring Tasks (from the HMP)

	Year					
Monitoring task	2005	2006	2007	2008	2009	2010
A1. Vegetation Plots	X	X		X		X
A2. Bird Community		X		TBD*		TBD
A2. CAGN Monitoring	X		X		X	
A3. Horned lizard, orange-throated whiptail and spadefoot toad	X	X	X		X	
A4. <i>Brodiaea filifolia</i>	X	X	X	X		
A5. Sensitive Plants	See Table 4 of the HMP	See Table 4 of the HMP	See Table 4 of the HMP	See Table 4 of the HMP	See Table 4 of the HMP	See Table 4 of the HMP
A6. Wildlife Corridors	X	X	X		X	
A3. Herp arrays	X	previously planned, but now discontinued				

*To be determined

fennel, ice plant and other non-native species. Also, it should be noted that habitat restoration activities, which include non-native plant removal, will be conducted between 2003-2008 on the “Greens”, Brouwer and Huff parcels by Morrow Development and Brookfield Homes, the developers of the La Costa Villages and the University Commons Open Space. These projects are ongoing and are considered mitigation for impacts associated with the various development projects.

During the 2005-2006 fiscal year many nonnative and invasive plants were removed from the HCA, including fennel (*Foeniculum vulgare*), artichoke thistle (*Cynara cardunculus*), tamarisk (*Tamarix* spp.), fountain grass (*Pennisetum setaceum*), eucalyptus (*Eucalyptus* spp.), castor bean (*Ricinus communis*), mustard (*Brassica* spp. and *Hirschfeldia incana*), acacia (*Acacia* spp.), hottentot fig (*Carpobrotus edulis*), date palms (*Phoenix canariensis*), myoporum (*Myoporum laetum*), pampas grass (*Cortaderia* spp.), slender-leaf iceplant (*Mesembryanthemum nodiflorum*), gazania (*Gazania* spp.), natal grass (*Melinis repens*), and tree tobacco (*Nicotiana glauca*). Approximately 100 fennel were sprayed; 500 artichoke thistle were sprayed; 20 tamarisk resprouts were sprayed; an acre of fountain grass was sprayed and many individual fountain grass were also treated; approximately 10 small to moderate-sized eucalyptus trees were cut and sprayed and/or drilled and filled; many castor bean shrubs were cut and sprayed; hundreds of mustard seedlings were sprayed; 20 acacia trees were cut and spayed; several patches of hottentot fig and slender leaf iceplant were sprayed; one date palm was drilled and filled; 10 myoporum

shrubs were cut and sprayed; 100 pampas grass clumps and seedlings were sprayed or removed; one patch of gazania was sprayed; approximately 1/4 acre of natal grass was sprayed; and hundreds of tree tobacco seedlings were sprayed or cut and sprayed.

The Huff restoration site was also treated six times for nonnative plants occurring in the restoration site. The majority of the plants treated are listed in the above paragraph.

We also sprayed all of the fuel breaks, which were covered in non-native species such as crown marigold (*Chrysanthamum* spp.), filaree (*Erodium* spp.), and mustard species. At this time we have most “zero” tolerance species under control, except for eucalyptus, which we have plan to remove during the 2006-2007 fiscal year.

In June of 2006 we weed-whipped and raked all non-native grass thatch from two of the vegetation plots (1 and 2) at the Greens property. We took photographs of our work and are sampling the areas using permanent vegetation plots. We want to determine if removing the nonnative grass (primarily purple false-brome) will have a positive or negative effect on thread-leaved brodiaea growth and establishment.

Additionally, in coordination with University of California at Davis, Agriculture Extension, we established two separate herbicide experiments. The first experiment was established to determine the effectiveness of an herbicide on the invasive and nonnative plant, onion weed. This experiment tested different rates of a specific herbicide on onion weed and other native plants that occurred in the test plots with onion weed. Additionally, this herbicide was also tested for it's effectiveness on onion weed seed production. The herbicide experiment will not be completed for another year at which time the results will be presented. The second experiment was established to test herbicide effectiveness on purple falsebrome as it occurs with thread-leaved brodiaea. This experiment was put on hold until CNLM is able to obtain permission from the CDFG for potential impacts that may occur to thread-leaved brodiaea through implementation of this experiment.

V. PUBLIC SERVICE

CNLM public service activities during the 2005-2006 fiscal year included patrolling, public outreach projects and public education. During this fiscal year, most of the public service activities at the HCA involved working with Eagle Scouts on trail projects, patrolling and enforcement and meeting with easement holders.

At this time, the western portion of the HCA (Box Canyon) is posted as “No Trespassing”. This is either because CNLM does not want people in the canyon area, or because access to the HCA requires people to cross over private land. The eastern portions of the HCA are open to the public for hiking and mountain biking, but no motorized vehicles or firearms are allowed.

Patrolling

CNLM patrolled the HCA on a regular basis, sometimes during biological surveys and sometimes during directed patrolling efforts. During the patrolling efforts, CNLM spent a considerable amount of time blocking off and patrolling trails that are not part of the designated trail system on the mountain located northeast of Camino Junipero and in other locations in the HCA. Fences and signs were installed directing users to the designated trails and contact was made with local users to inform them of the newly established, legal trail system. Additionally, several itinerant encampments were located on the HCA. These camps were posted with notices to vacate the premisses and all debris and refuse will be removed during the 2006-2007 fiscal year. Finally, several truckloads of trash were removed from the HCA during the 2005-2006 fiscal year. The majority of the trash was removed from the University Commons and Elfin Forest “off-site” parcels.

Public Outreach Projects and Public Education

We worked with three eagle scouts on trail related projects. One scout installed about 300 linear feet of post-and-rail fencing and one kiosk at the Box Canyon Trail. The other scouts installed a bench with a kiosk, a small kiosk at the Sito Salvia trailhead and about 100 linear feet of post-and-rope fencing to delineate a trail head. One of these scouts also helped us remove about 200 yards of unwanted trail.

In 2005, we mapped and created a permanent trail system that was posted by the summer of 2006 (Figures 5 and 6). In addition to the kiosks created by the Eagle Scouts, we posted six other kiosks at major trail heads and posted trail maps and pertinent HCA materials. We also posted about 20 trail signs to direct users throughout the HCA. In May of 2006, about twelve members of the San Diego Mountain Bikers Association helped us fix about 500 yards of trail by creating water bars and removing unwanted rocks from the trail. Additionally, CNLM worked with City of Carlsbad volunteers to improve the Box Canyon west trails system. Trail use has increased in the last years since the opening of Camino Junipero, and we have had many positive responses to our trail work and trail system.

During the spring, two nature walks were conducted in the HCA. The first nature walk was conducted in the Box Canyon north area, adjacent to the old RSF Road. Approximately 10 individuals attended that nature walk. The second nature walk was conducted northeast of San Elijo Road and Melrose Road. Approximately five individuals participated in that nature walk.

We have had occasional trespass into the Huff Canyon area and some vandalism of our trail signs. In 2002 we found evidence of numerous parties and bonfires near Box Canyon and on the Nelson property. We have not seen any evidence of these activities since early 2003 at these locations.

Rancho La Costa Habitat Conservation Area Trail Map

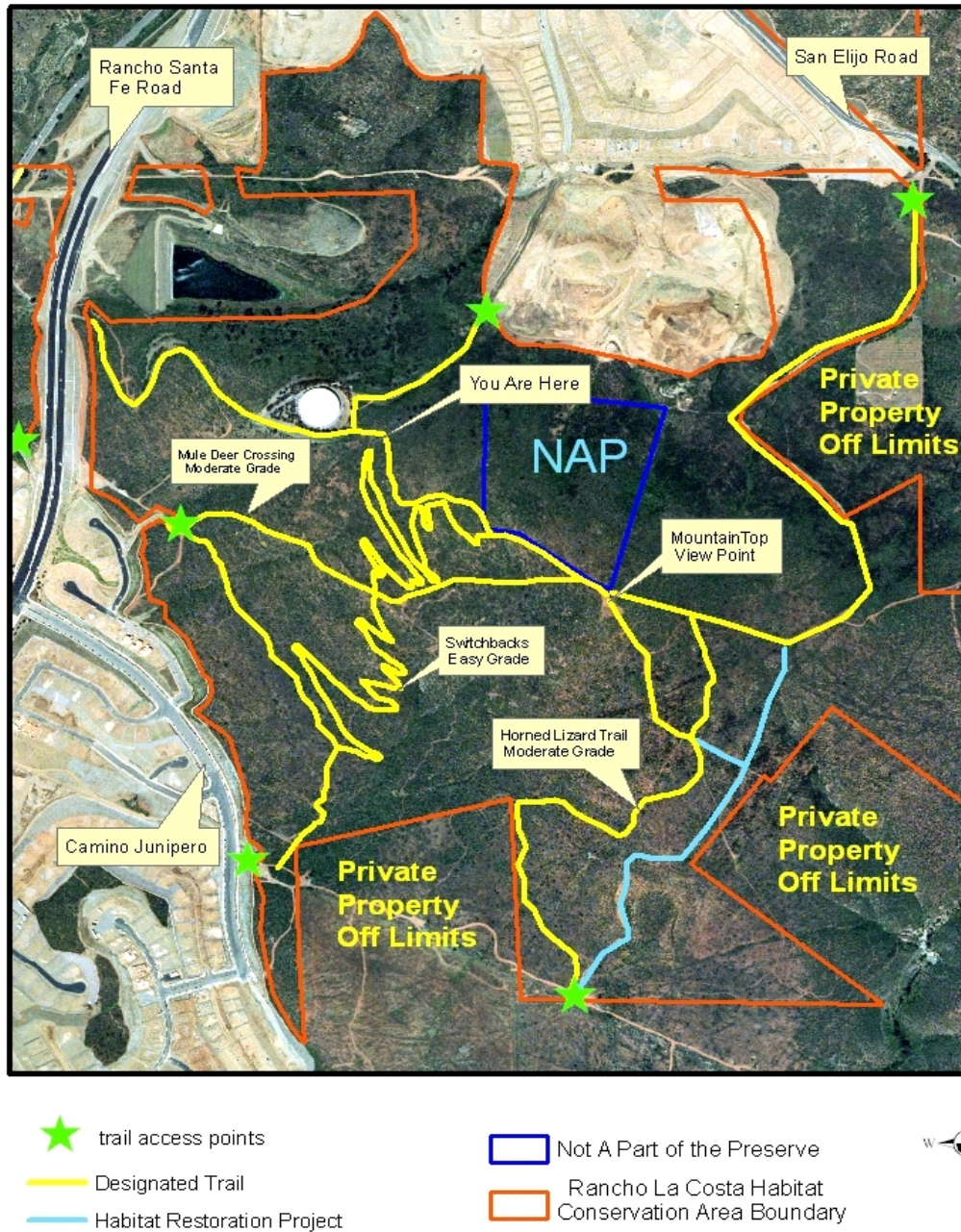


Figure 5.
Trail Map for Denk Mountain

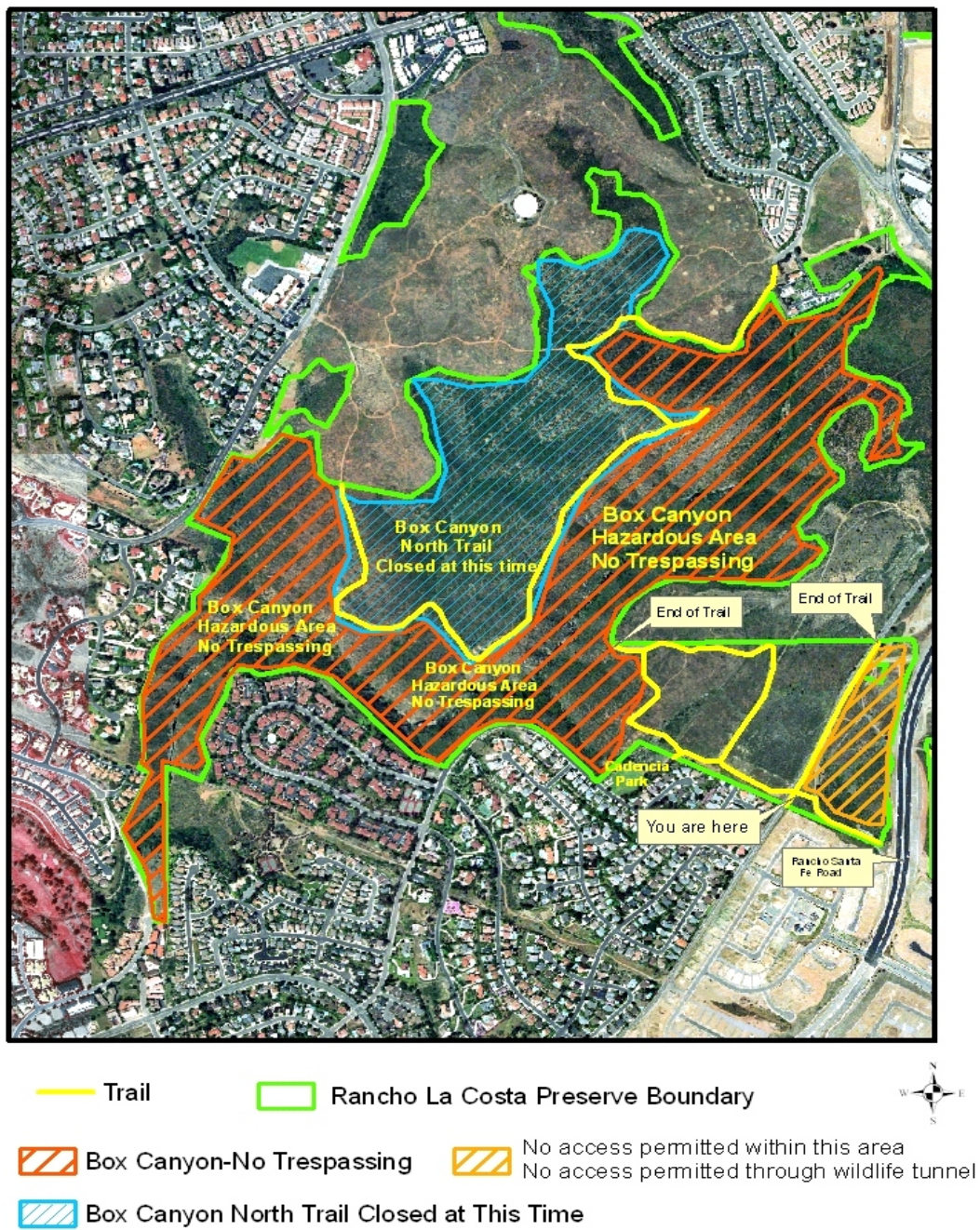


Figure 6.
Trail Map for Box Canyon

VI. REPORTING

Reporting activities include report writing, all data analysis, geographic information system (GIS) data gathering, compilation, and analysis, meetings and regional coordination, and photo documentation activities.

Data that have been entered into ARCVIEW GIS (9.1) includes sensitive species locations, parcel boundaries, sensitive plant and animal locations, pit array locations and photo-documentation stations.

About 20 photo-documentation stations were set up in 2003 and digital photographs were taken in each location. Photo-documentation was taken in 2006 at these stations. A number of photo's were taken during the year of habitat enhancement projects and plants and wildlife observed.

In June of 2005, the CNLM completed and submitted the *Habitat Management Plan for the Rancho La Costa Habitat Conservation Area*. This document summarizes work activities since project inception and provides direction and time lines for future work. This document covers all properties listed in the introduction of this document. It also provides budget and financial information.

This report represents the fifth annual report for the HCA. An annual work plan for 2006-2007 will be provided to the local jurisdictions and wildlife agencies in December of 2007 under a separate cover.

Finally, the HCA manager has maintained all necessary agency permits to allow the continued monitoring of the HCA's biota.

Budgets/Finances: The total 2005-6 expenditures for Nelson, La Costa Villages, University Commons and Elfin Forest (part of U.C.) were \$3,514, \$57,553, \$29,668 and \$4,268, respectively. All final expenditures were in line (i.e. not over budget) with projected fiscal year budgets.

VII. SUMMARY & DISCUSSION

Management at the Rancho La Costa Habitat Conservation Area this year was successful at protecting the HCA from human encroachment, building baseline biological data, removing non-natives and developing a better understanding of the HCA and its regional context. HCA management in the next year will involve more biological surveys, non-native plant removal and public outreach.

VIII. REFERENCES

CNLM 2005a. Rancho La Costa Habitat Conservation Area Annual Work Plan 2005-2006. December 2005.

CNLM 2005b. Habitat Management Plan for the Rancho La Costa Habitat Conservation Area. June 2005.

Desert Research Institute. 2006. <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?cavist+sca>. Retrieved in October 2006.